Design and Implementation of Smart Bell Notification System using IoT

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ABSTRACT: *Smart phones have become part of our daily life. People using smart phones have increased rapidly. The proposed paper is to provide a security system that combines the functions of smart phone and home network system. It enables the users to check the image of the visitor who is present at the door. It also saves all the images in their drive. We send an alert message to the Owner whenever the doorbell is pressed. Furthermore, the owner can call to the visitor with the help of our app. We are also providing a link in the SMS sent so that it redirects the user to the app.*

KEYWORDS: *Door Bell, Home Network, Internet of Things, Owner, Visitor*

I. INTRODUCTION

The goal of this paper is to design and implement a security system by integrating smart phone and home network service. When the visitor presses the doorbell, the device captures an image through the camera and sends that image of the visitor to the user. Our system provides a convenient userinterface for the user to view the image and can take appropriate action immediately. This is implemented by interlocking with the real time SMS server that send an alert message to the owner when the doorbell is pressed**.** The Internet of Things (IoT) is the system of physical articles, gadgets, vehicles, structures and different things which are installed with hardware, programming, sensors, and system availability, which empowers these items to gather and trade data. The Internet of Things (IoT) enables items to be detected and controlled remotely crosswise over existing system framework, making open doors for more straightforward incorporation between the physical world and PC based frameworks, and bringing about enhanced effectiveness, exactness and financial advantage; when IoT is enlarged with sensors and actuators, the innovation turns into an example of the more broad class of digital physical frameworks, which additionally envelops advancements, for example, brilliant networks, shrewd homes, insightful transportation and keen urban areas. Everything is exceptionally identifiable through its inserted processing framework yet can interoperate inside the current Internet foundation. Specialists appraise that the IoT will comprise of right around 50 billion protests by 2020. Microcontrollers as the name proposes are little controllers. They resemble single chip PCs that are regularly installed into different frameworks to work as preparing/controlling unit. For instance, the remote control is utilizing most likely has microcontrollers inside that do interpreting and other controlling capacities. Cloud computing is a data innovation (IT) worldview that empowers pervasive access to shared pools of configurable framework assets and larger amount benefits that can be quickly provisioned with negligible administration exertion, frequently finished the Internet. Distributed computing depends on sharing of assets to accomplish cognizance and economies of scale, like an open utility.

II. ARCHITECTURE

A framework engineering or frameworks design is the applied model that characterizes the structure, conduct, and more perspectives of a system. A design is a formal depiction and portrayal of a framework, composed in a way that backings thinking about the structures and practices of the framework.
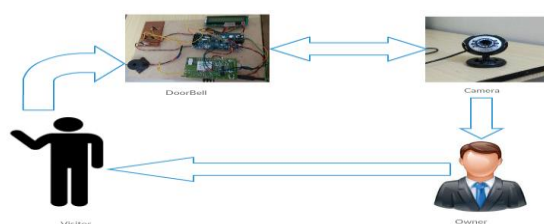

Fig 1) Architecture Diagram

Framework engineering passes on the enlightening substance of the components including a framework, the connections among those components, and the guidelines administering those connections. The compositional parts and set of connections between these segments that an engineering depiction may comprise of equipment, programming, documentation, offices, manual methodology, or parts played by associations or people.

Figure1 represents the overall procedure of our system. Visitor presses the doorbell then the camera captures image of the visitor and sends to the email registered and also sends an alert message to the owner saying that someone is waiting for you at the door.

III.   HARDWARE

1.Arm-7 controller-3.3v: It is the IoT platform used to connect the hardware devices.
2. GSM Modem-5v: It is used to send SMS to the owner.
3. Voltage convertor-16/2: It is used to convert the analog signals into digital signals.
4. Liquid Crystal Display-LCDs are
Accessible to show discretionary pictures
(as in a broadly useful PC show) or settled pictures which can be shown or covered up, for example, preset words, digits, and 7-fragment shows as in an advanced clock.
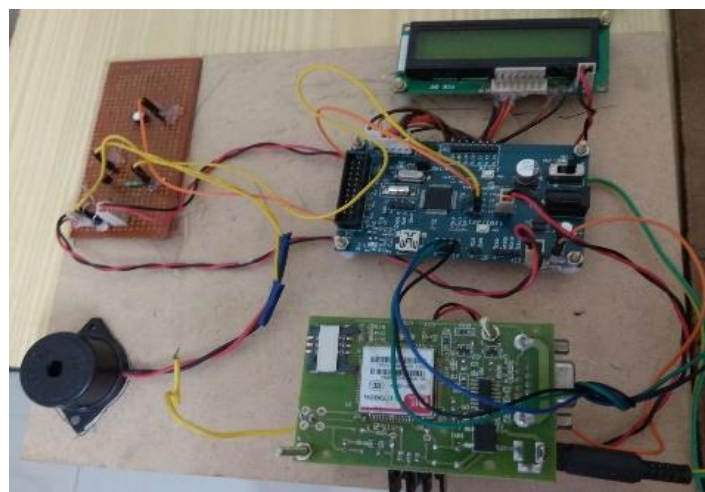

Fig.2) Smart Bell

Figure 2 shows the hardware of our project i.e.., all the devices are connected to a IoT platform ARM_7 Microcontroller

Fig.3) Camera

Figure 3. Is a camera that is connected to a system which takes the picture of the visitor standing at the door and it is connected to the MATLAB where the image processing is done.

IV.   WORKING

If a visitor presses the doorbell installed at the door of your house, this system takes a picture of the visitor and sends the image to the owner, and it also sends an alert message to the owner that someone is waiting for you at the door. This execution is outlined with ARM7TDMI processor. In these distinctive modules, for example, LPC2148, GSM, GPS, IR combine, 16*2 LCD are utilized. It is executed by utilizing two modules Base station module and In-Bus module. The In-Bus module comprises of IR match to include the quantity of people the transport and to discover correct area of transport GPS is utilized and the data can be gotten as a message by utilizing a GSM module. Networks are the fundamental components of the MATLAB condition. A network is a two-dimensional exhibit comprising of m lines and n segments. Uncommon cases are segment vectors (n = 1) and column vectors (m = 1). GSM (Global System for Mobile interchanges) is a cell organize, which implies that cell phones associate with it via looking for cells in the quick region. GSM systems work in four diverse recurrence ranges. Most GSM systems work in the 900 MHz or 1800 MHz groups. A few nations in the Americas utilize the 850 MHz and 1900 MHz groups in light of the fact that the 900 and 1800 MHz recurrence groups were at that point designated. ARM7 is best and generally utilized processor family in implanted framework applications. So we have chosen to pick ARM7 TDMI based NXP controller LPC2148. Likewise, ARM7 is a harmony amongst exemplary and new Cortex arrangement. ARM7 is great to get begin with as far as assets accessible on web and quality documentation gave by NXP. It suits consummately for fledglings to get inside and out thought regarding equipment and programming usage. LPC2148 is made by NXP Semiconductor (Phillips) and it is preloaded with numerous in-fabricated highlights and peripherals. This makes it more effective and dependable decision for a top of the line application designer. I would prefer not to rehash rundown of highlights from User Manual. I ask for you to hold client manual while perusing these instructional exercises. As we move along, we'll examine and utilize all highlights all through this arrangement. Presently how about we observe stick chart of LPC2148.
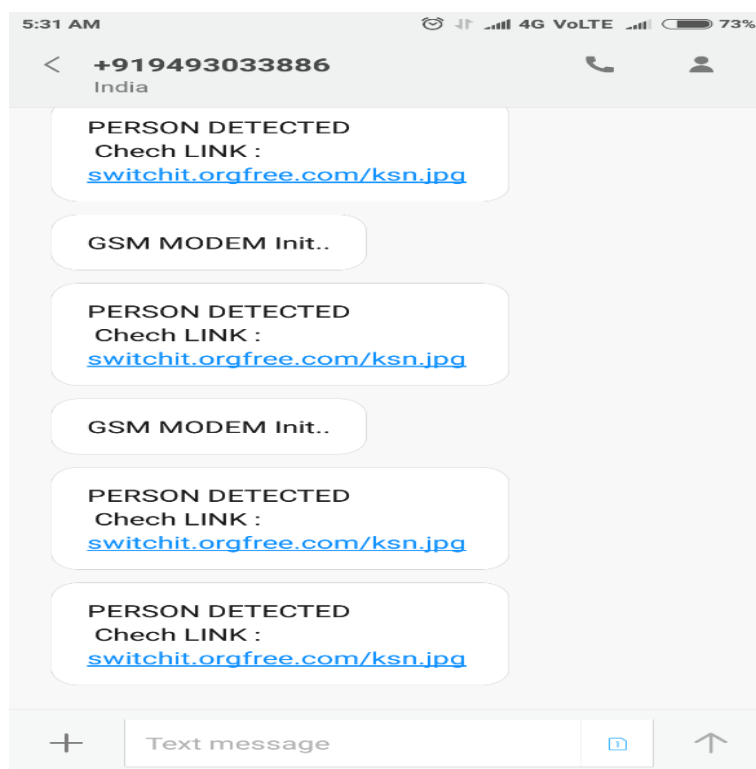

Fig 4) SMS sent to Owner

The image is processed through the MATLAB. We implemented the system using a C language and the front door monitoring feature through a WI-FI, web cam and a smart phone. The primary function largely consists of GSM Module to send the SMS to the owner when the doorbell is pressed.
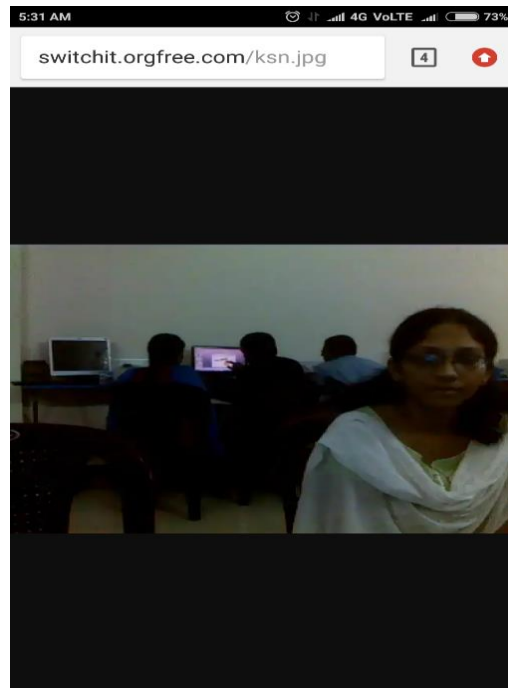
Fig.5) Image sent to the App

We will also store the images in the Google dive of the registered e-mail, so that the owner can check the images of the visitor if there is no signal at the time the visitor presses the doorbell. We are also providing a link in message provided which redirects to the app. The images are stored in the drive even though the message is not received by the owner at that particular time. We are trying to store the images in the drive because many times the person may not have signals in their mobile phones.
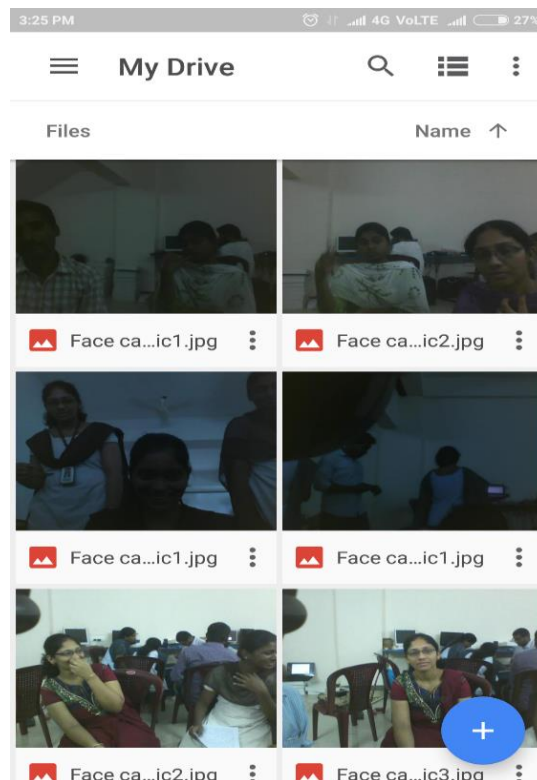

Fig.6) Images stored in Drive

V. CONCLUSION

In this paper, we discuss about the elements of Smart phone and home system network. We actualized the discontinuous notice framework using the current doorbell work. There are a few preferences. For instance, it permits the visitor to work framework advantageously. Right now, the framework is restricted in that just a single Web cam gadget can be usable. In the future, voice recognition and face recognition functionalities can be expanded to fortify the security.

VI. FUTURE ENHANCEMENT

We can upload even a video to our app to check what is happening infront of the door. The alert message can also be converted to voice message. We can also use cloud instead of using MATLAB and Keil software's. The image can be uploaded to a temporary cloud and can be retrieved in to the App from the cloud. This can be done through the Firebase cloud.

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